

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Seungkoo Kang, *et al.*

Serial No.: 10/695,060

Filed: 28 October 2003

Confirmation No.: 5976

Group Art Unit: 1711

Examiner: ASINOVSKY, Olga

For: **Superabsorbent Polymer**

FILED ELECTRONICALLY VIA EFS-WEB

Mail Stop AMENDMENT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

RESPONSE TO 7/27/2006 OFFICE ACTION

Sir:

In response to the Office Action mailed July 27, 2006, Applicants hereby submit the following remarks and amendments to the claims. **If any fees for this response are required, the Commissioner is hereby authorized to charge them to Deposit Account No. 502190.**

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 11 of this paper.

Amendments to the Claims:

1. (Currently Amended) ~~A superabsorbent~~ Superabsorbent polymer particles comprising
consisting essentially of:

a) a polymeric resin composition comprising

i) from about 55 to about 99.9 % by weight of polymerizable unsaturated acid group
containing monomers;

ii) from about 0.001 to about 5.0 % by weight of the polymerizable unsaturated acid
group containing monomers of an internal crosslinking agent;

iii) from 0 to about 25 % by weight of the polymerizable unsaturated acid group
containing monomers of a preneutralizing agent; wherein the polymeric resin composition is
preneutralized from 0 to about 50 mole %; wherein the polymeric resin composition is formed
into particles, and

b) a water swellable, water-insoluble aminopolysaccharide polymer particles;

wherein when the superabsorbent polymer is contacted with an aqueous solution, the polymeric
resin is neutralized by the aminopolysaccharide polymer so that the superabsorbent polymer
has a degree of neutralization of about 20 mole % or more than the preneutralization degree of
the polymeric resin composition wherein the polymeric resin composition particles and
aminopolysaccharide polymer particles are combined to form the superabsorbent polymer
particles.

2. (Currently Amended) The superabsorbent polymer particles of Claim 1 having a gel bed permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $100 \times 10^{-9} \text{ cm}^2$ or greater.

3. (Currently Amended) The superabsorbent polymer particles of Claim 1 having a liquid capacity as measured by the Centrifuge Retention Capacity Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 20 g/g or greater.

4. (Currently Amended) The superabsorbent polymer particles of Claim 1 having a liquid capacity as measured by the Centrifuge Retention Capacity Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 25 g/g or greater.

5. (Currently Amended) The superabsorbent polymer particles of Claim 1 having a Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $200 \times 10^{-9} \text{ cm}^2$ or greater.

6. (Currently Amended) The superabsorbent polymer particles of Claim 1 having a Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent

polymer particles having a particle size of from about 300 microns to about 600 microns of about $300 \times 10^{-9} \text{ cm}^2$ or greater.

7. (Currently Amended) The superabsorbent polymer particles of Claim 1 further comprising from about 0.001 to about 5.0 % by weight of the dry superabsorbent polymer of surface crosslinking agent applied to the particle surface.

8. (Currently Amended) The superabsorbent polymer particles of Claim 1 is a mixture of aminopolysaccharide and the polymeric resin in a weight ratio of about 5:95 to about 95:5, and the aminopolysaccharide is neutralized from 0 to about 25 mole %.

9. (Currently Amended) The superabsorbent polymer particles of Claim 1 wherein the aminopolysaccharide polymer is a chitosan polyamine.

10. (Currently Amended) The superabsorbent polymer particles of Claim 1 further comprising a surface treatment.

11. (Currently Amended) The superabsorbent polymer particles of Claim 10 having an Absorbency Under Load at 0.9psi as measured by the Absorbency Under Load Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 15 or more and Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $450 \times 10^{-9} \text{ cm}^2$ or greater.

12. (Currently Amended) ~~A superabsorbent~~ Superabsorbent polymer particles ~~comprising~~ consisting essentially of:

a) from about 1 to about 99 % by weight of crosslinked polyacrylic acid resin wherein the polyacrylic acid resin is preneutralized from 0 to about 50 mole %; and

b) from about 1 to about 99 % by weight of water swellable, water-insoluble aminopolysaccharide polymer particles wherein when the superabsorbent polymer particles ~~[[is]]~~ are contacted with an aqueous solution, the crosslinked polyacrylic acid resin is neutralized by the aminopolysaccharide polymer so the superabsorbent polymer has a degree of neutralization of about 20 mole % or more than the preneutralization degree of the polyacrylic acid resin and wherein the polymeric resin composition particles and aminopolysaccharide polymer particles are combined to form the superabsorbent polymer particles and said superabsorbent polymer particles has a particle size from about 300 micron to about 600 microns.

13. (Currently Amended) The superabsorbent polymer particles of Claim 12 wherein the crosslinked polyacrylic acid has a degree of neutralization of 30 mole % or more.

14. (Currently Amended) The superabsorbent polymer particles of Claim 12 having a liquid capacity as measured by the Centrifuge Retention Capacity Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 20 g/g or greater.

15. (Currently Amended) The superabsorbent polymer particles of Claim 12 having a liquid capacity as measured by the Centrifuge Retention Capacity Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 25 g/g or greater.

16. (Currently Amended) The superabsorbent polymer particles of Claim 12 having a Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $200 \times 10^{-9} \text{ cm}^2$ or greater.

17. (Currently Amended) The superabsorbent polymer particles of Claim 12 having a Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $300 \times 10^{-9} \text{ cm}^2$ or greater.

18. (Currently Amended) The superabsorbent polymer particles of Claim 12 further comprising from about 0.001 to about 5.0 % by weight of the dry superabsorbent polymer of surface crosslinking agent applied to the particle surface.

19. (Currently Amended) The superabsorbent polymer particles of Claim 18 having an Absorbency Under Load at 0.9psi as measured by the Absorbency Under Load Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 15 or more and Gel Bed Permeability as measured by the Gel Bed

Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $450 \times 10^{-9} \text{ cm}^2$ or greater.

20. (Currently Amended) The superabsorbent polymer particles of Claim 10 wherein the aminopolysaccharide polymer is chitosan.

21. (Currently Amended) An absorbent composite comprising [[a]] superabsorbent polymer particles comprising consisting essentially of:

- a) a polymeric resin composition comprising
 - i) from about 55 to about 99.9 % by weight of polymerizable unsaturated acid group containing monomers;
 - ii) from about 0.001 to about 5.0 % by weight of the polymerizable unsaturated acid group containing monomers of internal crosslinking agent;
 - iii) from 0 to 25 % by weight of the polymerizable unsaturated acid group containing monomers of a preneutralizing agent; wherein the polymeric resin composition is preneutralized from 0 to about 50 mole %; and
- b) a water swellable, water-insoluble aminopolysaccharide polymer;

wherein when the superabsorbent polymer is contacted with an aqueous solution, the polymeric resin composition is neutralized by the water swellable, water-insoluble aminopolysaccharide polymer and the superabsorbent polymer has a degree of neutralization of about 20 mole % or more than the preneutralized amount of the polymeric resin composition.

22. (Currently Amended) The absorbent composite of Claim 21 wherein the superabsorbent polymer ~~[[has]]~~ particles have a liquid capacity as measured by the Centrifuge Retention Capacity Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 20 g/g or greater.

23. (Currently Amended) The absorbent composite of Claim 21 wherein the superabsorbent polymer ~~[[has]]~~ particles have a liquid capacity as measured by the Centrifuge Retention Capacity Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 25 g/g or greater.

24. (Currently Amended) The absorbent composite of Claim 21 wherein the superabsorbent polymer ~~[[has]]~~ particles have a Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $200 \times 10^{-9} \text{ cm}^2$ or greater.

25. (Currently Amended) The absorbent composite of Claim 21 wherein the superabsorbent polymer ~~[[has]]~~ particles have a Gel Bed Permeability as measured by the Gel Bed Permeability Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $300 \times 10^{-9} \text{ cm}^2$ or greater.

26. (Currently Amended) The absorbent composite of Claim 21 wherein the superabsorbent polymer particles further ~~comprises~~ comprise from about 0.001 to about 5.0 %

by weight of the dry superabsorbent polymer of surface crosslinking agent applied to the particle surface.

27. (Currently Amended) The absorbent composite of Claim 21 wherein the superabsorbent polymer particles have ~~having~~ an Absorbency Under Load at 0.9psi as measured by the Absorbency Under Load Test on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about 15 or more and Gel Bed Permeability as measured by the Gel Bed Permeability Test of on superabsorbent polymer particles having a particle size of from about 300 microns to about 600 microns of about $450 \times 10^{-9} \text{ cm}^2$ or greater.

28. (Previously Presented) The absorbent composite of Claim 21 wherein the aminopolysaccharide polymer is a chitosan.

29. (Original) An absorbent composite of Claim 21 further comprising a mixture of fibers.

30. (Currently Amended) A process for the continuous production of superabsorbent polymer composition for absorbing aqueous or serous fluids, as well as blood, comprising the steps of:

- a) preparing a polymeric resin composition by reacting
 - i) from about 55 to about 99.9 % by weight of polymerizable unsaturated acid group containing monomers; and

ii) from about 0.001 to about 5.0 % by weight of polymerizable unsaturated acid group containing monomers of internal crosslinking agent; and

iii) from 0 to about 25 % by weight of polymerizable unsaturated acid group containing monomers of a preneutralizing agent; wherein the polymeric resin composition is preneutralized from 0 to about 50 mole %; and

b) preparing an aqueous solution containing a water swellable, water-insoluble aminopolysaccharide polymer;

c) mixing the polymeric resin composition with the aqueous solution containing aminopolysaccharide polymer to form the superabsorbent polymer; and

d) drying the superabsorbent polymer

wherein when the superabsorbent polymer is contacted with an aqueous solution, the polymeric resin composition is neutralized by the aminopolysaccharide polymer so the polymeric resin composition is neutralized by the water swellable, water-insoluble aminopolysaccharide polymer such that the superabsorbent polymer has a degree of neutralization of about 20 mole % of more than the preneutralization degree of the polymeric resin wherein the ratio of the superabsorbent polymer composition has a mean particle size of about 300 microns.

31. (Previously Presented) The process of Claim 30 wherein the aminopolysaccharide polymer is chitosan.

Remarks

The Office Action dated July 27, 2006, has been carefully considered.

Claims 1-27 and 30 have been amended for clarification.

Claims 1-31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pesce et al. The claims of the present invention specifically set forth the superabsorbent polymer particles consisting essentially of polymeric resin composition particles and an aminopolysaccharide polymer particles. Pesce et al. fails to disclose or suggest superabsorbent polymer particles consisting essentially of polymeric resin composition particles and an aminopolysaccharide polymer particles as set forth in the present claims. The amendment of claims 1-27 and 30 renders this rejection moot. Being moot, the rejection of claims 1-31 under 35 U.S.C. § 103(a) should be withdrawn.

Favorable reconsideration of the claims in the present application is respectfully requested. If, however, any issues remain unresolved, the Examiner is invited to telephone Applicants' counsel at the number provided below.

Respectfully submitted,

/Philip P. McCann/

Philip P. McCann
Registration No. 30,919

SMITH MOORE LLP
P.O. Box 21927
Greensboro, NC 27420
(336) 378-5302
phil.mccann@smithmoorelaw.com

Date: October 26, 2006

File No.: 5003073.033US1